

CLAIMS

We claim:

1. An optical conduit for illuminating a surface, comprising:
 - a body formed from optically transmissive material, having:
 - an input end for light input;
 - an output end for light output;
 - a curved surface that totally and internally reflects light from the input end towards the output end; and
 - a light source embedded at the input end of the body, such that light is channeled from the input end through the body and emitted out the output end.
2. The optical conduit as in claim 1, further comprising:
 - a reflector cup surrounding the light source, for redirecting light from the light source towards the output end of the body.
3. The optical conduit as in claim 2, wherein the curved surface of the body is a paraboloid.
4. The optical conduit as in claim 2, wherein the body is made up of sections of curved surfaces fitting different equations.
5. The optical conduit as in claim 2, wherein the light source is a light-emitting diode.
6. The optical conduit as in claim 2, wherein the body has a gradual bend so that the output end is at an angle to the input end.
7. The optical conduit as in claim 2, wherein the optically transmissive material is chosen from acrylic, polycarbonate, and optical grade plastic.
8. An optical mouse, comprising

- a housing;
- an image sensor within the housing for capturing images of a surface;
- a light source within the housing;
- an optical conduit made from optically transmissive material, channeling light
- 5 from the light source onto the surface, having:
 - a input end for light input;
 - a output end for light output; and
 - a curved interior surface that totally and internally reflects light from the
 - input end towards the output end; and
 - 10 a lens to focus light reflecting off of the surface onto the image sensor.

9. The optical mouse of claim 8, wherein the light source is glued to the exterior of the input end of the optical conduit.

- 15 10. The optical mouse of claim 8, wherein the light source is embedded within the input end of the optical conduit.

11. The optical mouse as in claim 10, further comprising:
 - a reflector cup surrounding the light source, for redirecting light from the light
 - 20 source towards the output end of the optical conduit.

12. The optical mouse as in claim 11, wherein the curved surface of the body is a paraboloid.

- 25 13. An optical mouse, comprising
 - a housing;
 - an image sensor within the housing for capturing images of a surface;
 - an optical conduit within the housing made from optically transmissive material,
 - the optical conduit having:
 - 30 a input end for light input;
 - a output end for light output; and

an interior surface that totally and internally reflects light from the input
end towards the output end;
a light source embedded within the input end of the optical conduit; and
a lens within the housing to focus light reflecting off of the surface onto the image
5 sensor.

14. The optical mouse of claim 13, further comprising:

a reflector cup surrounding the light source, for redirecting light from the light
source towards the output end of the optical conduit.
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